

CLAIMS

1. A hydraulic system for mining equipment comprising:
 - at least one hydraulic circuit (29, 30, 31, 32) with pressure fluid channels (22, 23, 24, 25, 26, 27, 34, 42) and at least one hydraulic pump (7, 8, 9, 10), the hydraulic pump being arranged to generate hydraulic power in the hydraulic circuit;
 - at least one power unit (6, 6a to 6d) for driving the hydraulic pump;
 - at least one hydraulic mining actuator (13, 14, 15) connected to the hydraulic circuit and configured to act on a tool (21) in the mining equipment;
 - at least one hydraulic auxiliary actuator (16 to 20) connected to the hydraulic circuit; and
 - means for adjusting the hydraulic power to be led to the mining actuator (13, 14, 15) and the auxiliary actuator (16 to 20) connected to the hydraulic circuit,

characterized in

 - that the hydraulic system (28) comprises a main hydraulic circuit (29) and at least one separate hydraulic circuit (30, 31, 32), and that the main hydraulic circuit (29) and each separate hydraulic circuit (30, 31, 32) are separate from each other, each having a separate hydraulic pump (7 to 10) for generating hydraulic power;
 - that at least one mining actuator (13, 14, 15) is connected to the separate hydraulic circuit (30, 31, 32), and that said mining actuator is configured to be driven by the hydraulic power acting in the separate hydraulic circuit; and
 - that the power of the mining actuator (13, 14, 15) connected to the separate hydraulic circuit (30, 31, 32) is arranged to be adjusted by adjusting the hydraulic power generated by the hydraulic pump (7, 8, 9) comprised by the separate hydraulic circuit.
2. A hydraulic system as claimed in claim 1, **characterized** in that the power of the mining actuator (13, 14, 15) connected to the separate hydraulic circuit (30, 31, 32) is arranged to be adjusted by adjusting the hydraulic pressure generated by the hydraulic pump (7, 8, 9) comprised by the separate hydraulic circuit.
3. A hydraulic system as claimed in claim 1 or 2, **characterized** in that the power of the mining actuator (13, 14, 15) connected to the

separate hydraulic circuit (30, 31, 32) is arranged to be adjusted by adjusting the hydraulic flow generated by the hydraulic pump (7, 8, 9) comprised by the separate hydraulic circuit.

4. A hydraulic system as claimed in any one of the preceding claims, **characterized** in that the mining actuator is one of the following: a percussion device (13) arranged to generate impact pulses in the tool (21) connected to the mining equipment; a rotation device (14) arranged to rotate the tool (21) connected to the mining actuator relative to its axis; a feed device (15) arranged to push the tool connected to the mining actuator in the axial direction.

5. A hydraulic system as claimed in claim 4, **characterized** in that the mining actuator is a percussion device (13), that the percussion device (13) is connected to a first separate hydraulic circuit (30) having a percussion device-specific first hydraulic pump (7), and that the power of the percussion device (13) is arranged to be adjusted by adjusting said hydraulic pump (7).

6. A hydraulic system as claimed in any one of the preceding claims, **characterized** in that the hydraulic system (28) comprises a plurality of mining actuators (13, 14, 15), that each mining actuator is connected to a dedicated separate hydraulic circuit (30, 31, 32), and that the power of each mining actuator (13, 14, 15) is arranged to be adjusted by acting on the hydraulic pump (7 to 9) comprised by said separate hydraulic circuit (30, 31, 32).

7. A hydraulic system as claimed in claim 6, **characterized** in that the hydraulic pump (7, 8, 9) of each separate hydraulic circuit (30, 31, 32) is arranged to be driven by a dedicated power unit (6a, 6c, 6d), and that the hydraulic power acting in each separate hydraulic circuit (30, 31, 32) is arranged to be adjusted by acting on the speed of rotation of the hydraulic pump (7, 8, 9) by means of the power unit (6a, 6c, 6d).

8. A hydraulic system as claimed in any one of the preceding claims, **characterized** in that at least one separate hydraulic circuit (30, 31, 32) comprises a pressure fluid tank (33a, 33b, 33c) separate from the other hydraulic circuits, the pressure fluid of said separate hydraulic circuit being arranged separate from the pressure fluids of the other hydraulic circuits.

9. A hydraulic system as claimed in any one of claims 1 to 7, **characterized** in that the hydraulic system (28) comprises a plurality of

separate hydraulic circuits (30, 31, 32), and that the separate hydraulic circuits (30, 31, 32) have a common pressure fluid tank (35a) separate from the main hydraulic circuit (29), the common pressure fluid used in the separate hydraulic circuits (30, 31, 32) being arranged separate from the pressure fluid of the main hydraulic circuit.

10. A hydraulic system as claimed in any one of the preceding claims, **characterized** in that the hydraulic power acting in the separate hydraulic circuit (30, 31, 32) is arranged to be adjusted by changing the displacement capacity of the hydraulic pump (7, 8, 9) comprised by said separate hydraulic circuit (30, 31, 32).

11. A method of adjusting the power of a rock drill machine, the rock drill machine (5) comprising at least the following drilling actuators: a percussion device (13), a rotation device (14) and a feed device (15), of which at least one is connected to a hydraulic circuit (29, 30, 31, 32), the method comprising:

generating hydraulic power in said hydraulic circuit with at least one hydraulic pump (7, 8, 9, 10);

driving the drilling actuator (14, 15, 16) connected to the hydraulic circuit by the hydraulic power acting in the hydraulic circuit;

adjusting the power of the drilling actuator connected to the hydraulic circuit by adjusting the hydraulic power to be fed to the drilling actuator,

characterized by adjusting the power of the drilling actuator connected to the hydraulic circuit mainly by adjusting the pumping output of the hydraulic pump (7, 8, 9).

12. A method as claimed in claim 11, **characterized** by adjusting the pumping of the hydraulic pump (7, 8, 9) by adjusting the displacement capacity of the pump.

13. A method as claimed in claim 11, **characterized** by adjusting the pumping of the hydraulic pump (7, 8, 9) by adjusting the speed of rotation of the pump.

14. A method as claimed in claim 11, **characterized** by adjusting the pumping of the hydraulic pump (7, 8, 9) by adjusting the speed of rotation and the displacement capacity of the pump.